

# Travelers' Diarrhea

## Traveler Summary

### Key Points

- Travelers' diarrhea (TD), the most common health problem for travelers, is an intestinal infection affecting up to 70% of travelers going to developing countries.
- Risk is higher for young adults, persons with underlying illnesses, and those taking medicines that decrease gastric acidity.
- Symptoms can vary from mild to severe and can include uncomfortable, crampy diarrhea with nausea or vomiting; fever sometimes occurs. Significant dehydration is uncommon in adults.
- Consequences of infection may include persistent diarrhea, recurrent diarrhea, and other chronic gastrointestinal discomfort.
- Prevention includes observing food and beverage precautions and hand hygiene (frequent, thorough handwashing) and treating water.
- No vaccine is available in the US, and preventive antibiotics are not recommended. A vaccine with limited effectiveness is available in some countries but is not recommended.
- Self-treatment includes fluid rehydration and antimotility or antisecretory agents. Travelers should reserve the use of antibiotics for severe diarrhea.

### Introduction

TD is the most common health problem for travelers, affecting up to 70% of travelers going to some developing countries. TD is caused primarily by bacteria (uncommonly by parasites or viruses) acquired through consumption of contaminated food or beverages. TD is characterized by the sudden onset of abnormally loose or liquid stools, such that the illness is either tolerable, interferes with many planned activities, or is incapacitating and prevents all planned activities. TD is usually a self-limiting disease that resolves in 3 to 4 days, but strategies are available to self-treat and shorten the duration of symptoms.

### Risk Areas

The traveler's destination is the most important determinant of risk. TD can be acquired whenever people from countries with a high level of hygiene travel to countries with a low level of hygiene. Developing countries in Africa, Asia, Latin America, and the Middle East are considered high risk. Most countries in southern Europe and a few Caribbean islands are deemed intermediate risk. Low-risk areas include Australia, Canada, northern Europe, Japan, New Zealand, the US, and several of the Caribbean islands.

### Transmission

Poor sanitation, the presence of stool in the environment, and the absence of safe restaurant practices lead to risk of diarrhea from eating a variety of foods contaminated by fecal organisms, especially bacteria. Because travelers are usually careful to avoid drinking untreated water, many acquire TD from eating contaminated food. In long-stay travelers and expatriates who tend to eat adventurously for longer periods of time, parasites can account for 10% to 20% of diarrhea. Persons with a vomiting predominant illness, with or without diarrhea, may have a norovirus infection (especially if other close individuals have a similar illness) and are highly infectious for others sharing living quarters or bathroom facilities.

### Risk Factors

Individuals at high risk for TD or adverse consequences include young adults (prone to risk-taking behavior and often on limited budgets); persons with compromised immunity, inflammatory bowel disease, or diabetes; and those taking medicines (e.g., omeprazole) that decrease gastric acidity.

### Symptoms

TD caused by bacteria typically presents with abrupt onset of uncomfortable, crampy diarrhea and may be accompanied by nausea or vomiting and, less commonly, fever. TD caused by parasites is usually mild and begins gradually with loose stools occurring in distinct episodes during the day, slowly becoming more bothersome and associated with fatigue. Significant dehydration is uncommon in adults. Persons with protozoal infections often do not seek medical care for several weeks due to the generally mild nature of the symptoms.

## Consequences of Infection

Persistent diarrhea, recurrent diarrhea, and other chronic gastrointestinal discomfort (e.g., bloating, gas, constipation) may occur as a result of TD. When diagnostic testing yields no other diagnoses, these chronic gastrointestinal symptoms may be attributed to "postinfectious irritable bowel syndrome."

## Need for Medical Assistance

Persons who develop bloody stools or severe symptoms such as intense cramps, fever and chills, or severe thirst (with inability to keep liquids down) that do not rapidly improve with self-treatment should seek medical attention. Illnesses unresponsive to self-treatment will require specific investigation for possible protozoal causes.

Immediate medical care is imperative if an infant or child shows signs of severe dehydration, bloody diarrhea, fever higher than 38.5°C (101.5°F), or persistent vomiting.

## Prevention

### Food and Beverage Precautions

Guaranteeing the safety of food and beverages is difficult if not impossible when traveling, especially in developing countries. Nevertheless, travelers can continue to enjoy local foods, which is part of the pleasure of international travel; however, completely avoiding diarrhea in certain high-risk destinations may not be possible, even with the strictest adherence to preventive measures. Although some evidence exists to suggest that where food is eaten is more important than what food is eaten, observing food and beverage precautions helps minimize risk and decreases the number of organisms ingested and the severity of TD if contracted. These precautions also help reduce the risk of other infections, such as dysentery, hepatitis A and E, giardiasis, typhoid, and paratyphoid.

Developing countries don't always have the resources needed to ensure a pure water supply; consequently, tap water is not safe to drink because bacteria or parasites in food or water may go undetected. Even if the local population can drink the water, travelers should not assume that they can. Residents have built up some immunity to organisms in the water, but visitors have not.

No vaccine is available in the US, and preventive antibiotics are not recommended. A vaccine with limited effectiveness is available in some countries but is not recommended.

See the following articles: *Food and Beverage Precautions* and *Treating Water*.

## Self-Diagnosis and Self-Treatment

The decision to self-treat depends on the severity of the functional disability caused by TD. Increased fluid intake is necessary to correct dehydration. Most cases will resolve with hydration and symptomatic treatment with antimotility or antisecretory agents (see Nonantibiotic Agents, under Drug Treatment). Adding antibiotics for moderate TD may shorten the duration or severity of illness. All severe TD cases should receive antibiotics.

Discuss self-treatment options with a health care provider to obtain appropriate medications for a personal medical kit for travel. A strategy for self-treatment of TD under different circumstances is shown in Table 1.

**Table 1: Treatment Options by TD Severity**

Severity of Diarrhea	Recommended Treatment
<i>Mild:</i> loose or liquid stools (without body symptoms) that are tolerable, not distressing, and do not interfere with planned activities.	<ul style="list-style-type: none"><li>• Antibiotics are not recommended.</li><li>• May use bismuth subsalicylate (BSS) or loperamide (for maximum of 48 hours) if necessary for comfort during sightseeing or travel and if not contraindicated.</li></ul>
<i>Moderate:</i> loose or liquid stools with cramps or nausea that interfere with planned activities.	<ul style="list-style-type: none"><li>• Antibiotic use not encouraged due to potential for inducing resistant bacteria. May consider empiric azithromycin. Quinolone antibiotics (ciprofloxacin, levofloxacin, ofloxacin) may be used if azithromycin is not carried or not available en route. Avoid quinolones for TD acquired in India and Southeast Asia.</li><li>• May use loperamide (for a maximum of 48 hours) as monotherapy or together with antibiotics if necessary for comfort during sightseeing or travel and if not contraindicated.</li></ul>

Severity of Diarrhea	Recommended Treatment
Severe: loose or liquid stools with cramps or nausea that are incapacitating or prevent planned activities. All dysentery (blood or pus in the stools) is considered severe.	<ul style="list-style-type: none"> <li>• Use empiric azithromycin</li> <li>• Stay in room and use toilet as necessary.</li> <li>• May use loperamide (for a maximum of 48 hours) if necessary for comfort, unless dysentery is present (blood or pus in the stools).</li> <li>• Pay attention to rehydration.</li> <li>• Seek medical attention if symptoms do not rapidly improve or if dysentery is present.</li> </ul>

## Fluid and Dietary Management

TD in adults is not typically associated with clinically significant dehydration, but replacement of fluids that are lost remains a cornerstone of self-treatment. Mild dehydration can be corrected with any fluid, and a patient should drink any available appropriate fluid until oral rehydration solution (ORS) is obtained. ORS is designed to be rapidly absorbed from the intestine, thus it can be useful even in the presence of vomiting. If an ORS is thought to be indicated, many stores and pharmacies in developing countries carry ORS packets. Travelers going to remote areas should carry their own ORS packets. If not hungry, the ill traveler should drink fluids and not force food. If hungry, eating is encouraged, but avoid alcohol, coffee, strong tea, spicy food, greasy food, and dairy products.

For treating dehydration in children, the following recommendations for use of ORS should be followed:

- Severe dehydration, bloody diarrhea, fever higher than 38.5°C (101.5°F), or persistent vomiting: Immediate medical care is imperative for infants and children.
- Mild to moderate dehydration: Give 60 to 120 mL (2-4 oz) of ORS for every loose stool or vomiting episode to an infant weighing less than 10 kg (22 lb), and give 120 to 240 mL (4-8 oz) to children weighing more than 10 kg.
- Recovery period: Introduce a normal diet as quickly as the child will accept it. Use of specific, restrictive, or liquid diets or withholding food is not necessary.

## Drug Treatment

### Nonantibiotic Agents

Loperamide (an antimotility drug), which is available over-the-counter, appears to be safer than diphenoxylate (Lomotil), a prescription medicine. Take 4 mg initially; if mild diarrhea continues, take an additional 2 mg every 6 hours, not to exceed 8 mg/day for over-the-counter use and 16 mg/day by prescription; the latter accounts for physician screening for patient contraindications. For children aged  $\geq 2$  years, loperamide may be dosed at 0.25 mg/kg/day when the modest benefit of a 1-day reduction in the duration of diarrhea is worth the slight risk of an adverse event. Taking higher than the recommended dose of loperamide can cause cardiac adverse events that may result in death in significant overdoses.

Antimotility agents sometimes induce prolonged constipation, even at low doses, and can lead to a bloated, uncomfortable feeling if taken for moderately severe infections without taking an antibiotic as well. Use of these agents should be discontinued if symptoms last more than 48 hours. Loperamide should not be taken by travelers with fever or with bloody stool. Antisecretory agents, such as bismuth subsalicylate (BSS; i.e., Pepto-Bismol and the US formulation of Kaopectate), can also improve some symptoms of TD.

### Antibiotics

Travelers are often in areas where prompt, effective medical care is unavailable. Therefore, self-treatment of bacterial diarrhea with antibiotics prescribed and purchased prior to leaving for the trip may be more practical. The use of antibiotics can turn a 3- or 4-day illness into a 1-day illness. However, antibiotic use for TD increases the intestinal carriage of antibiotic-resistant bacteria in returning travelers, especially in South Asia where 80% of travelers treated with antibiotics acquired resistant bacteria. Antibiotic choice for the treatment of moderate (antibiotics discouraged) and severe TD in adults is shown in Table 2.

**Table 2: Antibiotic Treatment for Severe and Moderate Bacterial TD in Adults<sup>1</sup>**

Causative Intestinal Organism	Antibiotic Prescription <sup>2</sup>	Dose/Schedule	Primary Contraindications

Causative Intestinal Organism	Antibiotic Prescription <sup>2</sup>	Dose/Schedule	Primary Contraindications
Typical noninvasive bacterial causes of severe TD	Azithromycin 500 mg; 4 tablets	1,000 mg orally, single dose <sup>3, 4</sup>	Azithromycin allergy
		If symptomatic after 24 hr: continue with 500 mg orally, once per day for 2 more doses	
	Ciprofloxacin 500 mg; 6 tablets	750 mg single dose (1½ tablets)	Quinolone allergy; pregnancy; concomitant administration with tizanidine
		If symptomatic after 24 hr: continue with 500 mg orally, twice per day for 4 more doses	
	Levofloxacin 500 mg; 3 tablets	500 mg orally, single dose	Quinolone allergy; pregnancy
		If symptomatic after 24 hr: continue with 500 mg orally, once per day for 2 more doses	
	Ofloxacin 400 mg; 6 tablets	400 mg orally, single dose	Quinolone allergy; pregnancy
		If symptomatic after 24 hr: continue with 400 mg orally, twice per day for 4 more doses	
Noninvasive <i>E. coli</i> that cause TD (includes ETEC, EPEC, EAEC)	Rifaximin 200 mg; 9 tablets	200 mg orally, 3 times per day for 3 days	Rifamycin (or component) allergy; pregnancy; adults 65 years and older (studies on safety in this age group have not been done)

1. For use when fluid rehydration and antimotility or antisecretory agents are insufficient and diarrhea is severe or moderate (per Table 1). Antibiotic use increases intestinal carriage of antibiotic-resistant bacteria in returning travelers; travelers should be encouraged to restrict the use of antibiotics to self-treatment of diarrhea that is severe.
2. Side effects  
Azithromycin: Those with heart problems or heart rhythm problems should only use azithromycin under the supervision of a physician.  
Quinolones (ciprofloxacin, levofloxacin, ofloxacin): At the first sign of tendon pain, swelling, or inflammation, the traveler should stop taking the quinolone, avoid exercise and use of the affected area, and seek medical assistance. Quinolones may cause photosensitivity reactions in the tropical sun.
3. Seek medical attention as soon as possible for bloody stools. If effective medical care or medical consultation is unavailable, self-treatment is recommended. Preferred regimen for dysentery (bloody diarrhea) is a full 3-day course with a 1,000 mg initial dose.
4. The 1,000 mg single dose (two 500 mg tablets) can be split into 2 separate doses over the first day to reduce side effects.

## Antiparasitic Drugs

In general, patients should not carry these medicines for self-treatment. See a health care provider because a proper diagnosis for parasitic infection is necessary, and these medicines are administered under supervision. Travelers going to extremely remote locations or on long trips may be given tinidazole to carry on a case-by-case basis.

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